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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,624	09/28/2001	Yukio Hemmi	214586US3	1880

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EXAMINER	
PALABRICA, RICARDO J	

ART UNIT	PAPER NUMBER
3641	

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/964,624	HEMMI ET AL.	
	Examiner	Art Unit	
	Rick Palabrica	3641	

-- Th MAILING DATE of this communication appears on the cov r sh t with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) *5-13* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Applicant's amendment in Paper No. 10, correcting the specification and amending claim 1, is acknowledged.

2. The applicant also traversed the rejection of claims. Applicant's arguments have been fully considered but they are not persuasive because the arguments are based either on features that are not recited in rejected claims or on statements that are not supported by actual proof or evidence and therefore have no probative value.

Applicant traversed the use of Nagase et al. '202 on the grounds that:

- Their control method is impossible to set the Fe/Ni ratio to 2 and more because there is no quantitative relationship between the Fe/Ni ratio in the reactor water and the Fe/Ni ratio in terms of the total generation amount of Fe and Ni. *This argument is unconvincing because Nagase et al. '202 clearly disclose in their Abstract and in claim 1 that the Fe/Ni ratio is adjusted from about 2 to 10. Note that every patent is presumed valid (35 U.S.C. 282), and that presumption includes the presumption of operability (Metropolitan Eng. Co. v. Coe, 78 F.2d 199, 25 USPQ 216 (D.C.Cir. 1935). Also, applicant's allegation has no probative value because it is not supported by actual proof or evidence, i.e. it constitutes no more than an uncorroborative statements of the applicant (see MPEP 716.01(c).*

- Their control method has the disadvantage of increasing radioactivity unlike the claimed invention. *This argument is unconvincing because the alleged advantage of the applicant's invention is a feature not recited in the claims. Note that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Also, if the Applicant considers this undisclosed feature to be critical to his method then the claims would be rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.*

Applicant traversed the use of Nishino et al. on the grounds that their method is different from the claimed invention. *This argument is unconvincing for reasons given in section 7 below.*

Applicant traversed the use of Nagase et al. '269 on the grounds that:

- Their method does not show a Fe/Ni molar ratio of 2 or more in Fig. 2. *This is unconvincing because Fig. 2 shows a range of Fe/Ni concentration ratios beyond 2. Furthermore, Nagase et al. '269 does not preclude application of the method for values of the Fe/Ni ratio greater than 2.*
- Their method disadvantageously results in the generation of NiO. *Again, this is unconvincing because it is based on a feature not recited in the claims.*

- Their method does not result in having the Co-60 concentration in the reactor water close to zero, unlike the claimed invention. *Again, this is unconvincing because said feature regarding limiting the Co-60 concentration is not recited in the claims.*

- Their method for reducing the amount of radioactive substances to almost zero is expensive, unlike the claimed invention. *Again, this is unconvincing because said feature of reduced cost of treatment for radioactivity is not recited in the claims.*

Applicant traversed the use of Niedrach and Hettiarachchi on the grounds that:

- Their control methods require "a large amount of expensive precious metals" making them uneconomic. *Again, this is unconvincing because said feature of the claimed invention being economic compared to others is not recited in the claims.*

- Their control methods require coating that must exhibit excellent stability that has not been obtained until now. *This is unconvincing because every patent is presumed valid (35 U.S.C. 282), and that presumption includes the presumption of operability (Metropolitan Eng. Co. v. Coe, 78 F.2d 199, 25 USPQ 216 (D.C.Cir. 1935). Also, applicant's allegation has no probative value because it is not supported by actual proof or evidence, i.e. it constitutes no more than an uncorroborative statements of the applicant (see MPEP 716.01(c).*

- Their method for coating is expensive, unlike the claimed invention. *Again, this is unconvincing because said feature of reduced cost of treatment for radioactivity is not recited in the claims.*

Applicant traversed the use of Lin on the grounds that the "effects described in Lin are believed to be highly doubtful." Underlining provided. *This is unconvincing because every patent is presumed valid (35 U.S.C. 282), and that presumption includes the presumption of operability (Metropolitan Eng. Co. v. Coe, 78 F.2d 199, 25 USPQ 216 (D.C.Cir. 1935). Also, applicant's allegation has no probative value because it is not supported by actual proof or evidence, i.e. it constitutes no more than an uncorroborative statements of the applicant (see MPEP 716.01(c).*

Applicant traversed the use of Carter on the grounds that:

- The method is expensive and the "industrial applicability of the Carter process is quite small." *Again, this is unconvincing because said feature of reduced cost of treatment for radioactivity is not recited in the claims. Also, applicant's allegation regarding the limited industrial applicability of the Carter process has no probative value because it is not supported by actual proof or evidence, i.e. it constitutes no more than an uncorroborative statements of the applicant (see MPEP 716.01(c).*

- The method of using EDTA obstructs cement solidification treatment of waste from a BWR plant. *This argument is unconvincing because the alleged advantage of the applicant's invention of avoiding the said problem is a feature not recited in the claims. Note that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Also, if the Applicant considers this undisclosed feature to be critical to his method then the claims would be rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.*

Applicant traversed the use of Honda et al. on the grounds that:

- The method is "quite silent about the use of natural zinc." *This argument is unconvincing because Honda et al. disclose the use of an alloy filter containing zinc (see column 15, lines 27+). The term "zinc" inherently includes natural zinc.*
- Their method generates ZnO, unlike the claimed invention. *This argument is unconvincing because the alleged advantage of the applicant's invention of avoiding the said problem is a feature not recited in the claims.*

Applicant traversed the use of Midorikawa et al. on the grounds that:

- Their method is limited to addition of Zn to 1 ppb and therefore inhibits the deposition of radioactive substance to only about 10% of the claimed

invention. *This argument is unconvincing because the claims recite addition of zinc "up to 5 ppb". The term "up to" includes the 1 ppb value of* Midorikawa et al.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e., failing to provide an enabling disclosure.

Amended claim 1 recites the limitation, "applying a preliminary oxidation treatment in advance to nickel base alloy material which is used in a feed water heater and a fuel assembly of a nuclear reactor, so that a nickel concentration in a reactor water is maintained to be less than 0.2 ppb." Underlining provided. There is neither an adequate description nor enabling disclosure as to how and in what manner the cited nickel concentration in the reactor water can be maintained only by preliminary oxidation treatment of a feed water heater and a fuel assembly. How about the many other components that are sources of nickel, such as components made of stainless

steel including the pressure vessel, piping, valves, bolts, weld materials, etc.? The contributions of these components in generating nickel that eventually goes into the reactor water cannot be suppressed by pre-oxidizing only the feed water heater and fuel assemblies.

Claim Rejections - 35 USC § 112

4. Claims 1-4 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The reason for this rejection is the same as the reasons for the objection to the specification (see section 3 above), and said reason is accordingly incorporated herein.

5. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are method steps to control of nickel concentration of sources of this element other than the feed water heater and fuel elements. See also section 3 above.

6. Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation of applying a preliminary oxidation treatment in advance to nickel base alloy material. The terms "preliminary" and "in advance" are relative terms that can be given no definite meaning and accordingly they render the claims vague and indefinite, and the metes and bounds thereof are undefined. These terms require proper references in order to be adequately defined.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Nagase et al. (U.S. 4,894,202) [hereinafter referred to as Nagase et al. (202) or Nishino et al. (U.S. 4,927,598) in view of Nagase et al. (U.S. 5,398,269) [hereinafter referred to as Nagase et al. (269)] and Carter (U.S. 4,526,626). Either one of Nagase et al. (202) or Nishino et al. disclose the applicant's claims except for the specific concentration limit on iron in the reactor water and the preliminary oxidation treatment of nickel base material.

Nagase et al. (202) disclose a method for inhibiting radioactive substances eluting into the primary cooling water of a nuclear plant comprising the step of adjusting the Fe/Ni molar concentration ratio in the cooling water from about 2 to 10 (see Abstract and claim 1).

Nishino et al. disclose a method of reducing radioactivity of piping in a primary cooling water recirculation line and various apparatus and devices in a nuclear plant by converting nickel and/or cobalt into nickel ferrite and/or cobalt ferrite (see column 2, lines 13-18). They claim that said conversion can be effected by an Fe/Ni stoichiometric ratio of 2 (see column 4, lines 56-60 and Example 1 on column 5).

,Nagase et al. (269) disclose a water quality method in a nuclear power plant that reduces the ^{60}Co ion concentration in the reactor water. They teach that the conventional method of reactor water control using Fe/Ni concentration ratio as control index is not enough because although it may maintain the ^{58}Co ion concentration at a low level, the ^{60}Co ion concentration possibly increases beyond an estimated level (see column 1, lines 33-41). To address this ^{60}Co problem, they teach a method of controlling iron concentration in the feed water below 0.1 ppb and below 0.05 ppb (see claims 3 and 4). One having ordinary skill in the art would have recognized the advantage of limiting the iron concentration in addition to controlling the Fe/Ni concentration ratio in the reactor water, i.e., reduced coolant radioactivity and lower potential exposure of plant personnel.

As to the limitation in claim 2 regarding an upper limit of 0.04 ppb for the iron concentration, note that Nagase et al. (269) disclose an iron concentration of "below 0.05 ppb" that anticipates the claimed iron concentration.

As to the limitation in the claims regarding iron and how it is carried into the system, the method disclosed by either one of Nagase et al. or Nishino et al. results in iron being inherently carried into the nuclear reactor and corrosively eluted from structural material within the nuclear reactor into the reactor water, and such results cannot be prevented. Also, the control their method includes a means for removing iron from the reactor water (see Fig. 1 and column 4, lines 6+ in Nagase et al. (202) or Fig. 1, column 7, lines 32+ in Nagase et al. (269)).

Carter discloses an anti-corrosion treatment of the internal surfaces of PWR coolant circuits. Note that the primary coolant circuit inherently includes the feed water heater and the fuel assemblies in the nuclear core. The materials used in these circuits are typically stainless steel, nickel-chromium alloys or cobalt-chromium alloys. He further teaches that the process may be used to pretreat the circuit during the pre-commissioning phase of the plant. His process results in reduces cobalt or nickel release rate that, in turn, result in reduced levels of radioactive contamination in PWR primary coolant circuits. See column 2, lines 44+. Carter discloses several examples of the application of his method that results in no detectable nickel (e.g., see column 7, lines 10+ and 35+, column 8, lines 1+, 16+ and 31+).

One having ordinary skill in the art would have recognized that all three references are in the same field of endeavor of reducing the radioactive contamination

in the primary coolant circuit of a nuclear reactor. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of either one of Nagase et al. (202) or Nishino et al. by the teachings of Nagase et al. (269) and Carter, in order to have a method of controlling water quality in a nuclear reactor comprising the steps of pretreating the feed water heater and fuel assembly to have a nickel concentration in the reactor water of less than 0.2 ppb, and making the amount of iron at least twice the amount of nickel, and limiting the amount of iron up to 0.1 ppb and up to 0.04 ppb, in order to gain the advantages thereof, as this is no more than the application of well known techniques of reactor water quality control and contamination reduction in the primary coolant circuit within the nuclear art.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of the Nagase et al. (202) - Nagase et al. (269) – Carter combination or Nishino et al. - Nagase et al. (269) – Carter combination as applied to claims 1-3 above, and further in view of either one of Honda et al. (U.S. 4,828,790) or Midorikawa et al. (U.S. 5,995,576). Either one of the Nagase et al. (202) - Nagase et al. (269) –Carter combination or the Nishino et al. - Nagase et al. (269) –Carter combination disclose the applicant's claims except for the addition of natural zinc.

Honda et al. disclose a method for inhibition of deposition of radioactive substances on nuclear power plant components contacting reactor-cooling water containing radioactive substances. Their method involves introducing polyvalent metal cations, including zinc ions, into the reactor cooling water in a concentration of 3 ppb to

1000 ppm (see claims 1 and 3, and column 4, lines 34-39). Midorikawa et al. discloses a method of inhibiting radioactive material deposition in primary coolant structure of a nuclear power plant. Their method comprises adding a mixture of metal ions containing zinc into the primary cooling system, wherein the zinc ion concentration is limited to a maximum of 1 ppb (see claims 1 and 8). One having ordinary skill in the art would have recognized that introducing zinc in the reactor water provides the advantage reducing potential doses to cognizant plant personnel by preventing radioactive material deposition on certain primary coolant structures, systems and components.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of either one of the Nagase et al. (202) - Nagase et al. (269) –Carter combination or the Nishino et al. - Nagase et al. (269) –Carter combination, by the teaching of either Honda et al. or Midorikawa et al., in order to have a method of controlling water quality in a nuclear reactor that further comprises introducing natural zinc into the reactor water to limit a zinc ion concentration value to up to 5 ppb, in order to gain the advantages thereof, as this is no more than the application of well known techniques within the nuclear art.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick Palabrica whose telephone number is 703-306-5756. The examiner can normally be reached on 7:00-4:30, Mon-Fri; 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 703-306-4198. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7687 for regular communications and 703-305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

RJP
February 11, 2003

MICHAEL [illegible]
SUPERVISORY PATENT EXAMINER